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Evaluation of the thorax shape in the transverse plane with simple clinical technique

Thomasz Kotwicki*, Iwona Zielinska-Kaszubowska, Andrzej Szulc

From 7th International Conference on Conservative Management of Spinal Deformities
Montreal, Canada. 20-22 May 2010

Introduction

Cobb angle measures the shadows of the two limit vertebrae while scoliotic deformity is a complex 3D phenomenon. There is a deficiency of simple clinical methods of thorax shape evaluation. The objective of the study was to investigate the technique measuring thorax transverse plane deformity in patients with idiopathic scoliosis.

Methods

Thirty scoliotic girls, aged 14.4 ± 1.5 years, single thoracic scoliosis (Lenke 1), thoracic Cobb $54.1 \pm 24.7^\circ$, and 30 healthy volunteers matched for sex and age (14.7 ± 1.8 years) were examined with Martin anthropometric caliper. The length of the long and the short horizontal axes of the thorax were measured at the level of xiphoid process (upper index) and of lowest costal arch (lower index), both on maximum inspiration and expiration. Asymmetry index defined as difference of the length of the two axes expressed as percentage of the shorter one was calculated.

Results

The upper asymmetry index in the study group was 35.2 ± 18.6 (inspiration) and 35.3 ± 19.0 (expiration), while in the control group it was 13.6 ± 13.6 and 13.6 ± 13.0 , respectively, difference significant, $p < 0.001$. The lower asymmetry index in the study group was 26.2 ± 12.9 and 24.9 ± 11.0 , while in the control group it was 12.5 ± 11.7 and 10.1 ± 10.7 , respectively, difference significant, $p < 0.001$.

Discussion

Simple method of assessment of thorax asymmetry, adapted for both static and dynamic conditions may be a helpful tool for clinicians.

Conclusions

Thorax asymmetry index revealed significantly higher value in scoliotic patients. Asymmetry of respiratory movements was measured.

Published: 10 September 2010

doi:10.1186/1748-7161-5-S1-O11

Cite this article as: Kotwicki *et al.*: Evaluation of the thorax shape in the transverse plane with simple clinical technique. *Scoliosis* 2010 5(Suppl 1):O11.

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University of Medical Sciences, Poznan, Poland
Full list of author information is available at the end of the article